REPORT

TO

THE SECRETARY OF THE SMITHSONIAN INSTITUTION,

ON THE

FISHES OF THE NEW JERSEY COAST,

AS OBSERVED IN THE SUMMER OF 1854.

BY

SPENCER F. BAIRD,

ASSISTANT SECRETARY, S. I.

FROM THE NINTH ANNUAL REPORT OF THE SMITHSONIAN INSTITUTION,
FOR 1854.

WASHINGTON:
BEVERLEY TUCKER, SENATE PRINTER.
JUNE, 1855.

Digitized by the Internet Archive
in 2017 with funding from
This project is made possible by a grant from the Institute of Museum and Library Services as administered by the Pennsylvania Department of Education through the Office of Commonwealth Libraries

https://archive.org/details/reporttosecretar00bair

REPORT

ON THE

FISHES OBSERVED ON THE COASTS OF NEW JERSEY AND LONG ISLAND DURING THE SUMMER OF 1854, BY SPENCER F. BAIRD, ASSISTANT SECRETARY OF THE SMITHSONIAN INSTITUTION.

A period of six weeks spent on the coast of New Jersey, principally at Beesley's point, and Long Island, New York, furnished an opportunity of studying the habits and distribution of the principal species of fishes that are found on that portion of our shores during the summer. Although many others, doubtless, are to be found in the same region, yet none have been introduced except those which were actually caught and carefully examined. A considerable number of the species whose habits and peculiarities are given at some length, have hitherto had nothing placed on record concerning them; and it is hoped that the present article may be found to contain some interesting information, given here for the first time, in addition to its character as a contribution to our knowledge of the geographical distribution of species.

The difference of the names applied to the same species of fish at various points of our coast, even when these happen to be connected very closely, both commercially and geographically, must strike every one with astonishment.

It is scarcely too much to say that no one species of fish bears the same vernacular appellation from Maine to Maryland, still less to Florida or the coast of Texas. This is probably owing to the fact that our shores have been originally settled by various nations from widely remote parts of Europe, each introducing its peculiar nomenclature, or deriving names from the equally isolated aboriginal tribes with their various languages. Thus the names of blue fish, white fish, perch, black fish, bass, king-fish, porgee, hake, tailor, whiting, horse mackerel, shad, smelt, dog-fish, &c., may apply equally to two or more very different species. Among the synonyms of the species will be found the vernacular equivalents in the regions visited, together with some from other localities. It will be sufficiently evident, therefore, that before any species referred to under a trivial name can be identified, the origin of the fish or that of the writer must be ascertained.

Although most of the facts recorded in the following paper have reference to Great Egg harbor, New Jersey, during a period extending from the middle of July to the end of August, it has been thought not amiss to incorporate the results of a visit to Brooklyn, Riverhead, and Greenport, Long Island, as well as to some points on the Hudson river, in September. Some valuable information was thus obtained tending to illustrate more fully the natural history and distribution of the species found on the New Jersey coast.

And here I take occasion to render an acknowledgement for much kind assistance and important information derived from various gentlemen at the different points of operation. Among these I will particularly mention Messrs. Samuel and Charles Ashmead, at Beesley's point, who devoted all their time to the furtherance of my objects in this exploration. I may also mention Messrs John Stites, Willis Godfrey, Washington Blackman, John Johnson, in fact, most of the residents of Beesley's point. Much benefit was derived at Greenport, Long Island, from the companionship of Mr. E. D. Willard, of the National Hotel, Washington; while to Mr. J. Carson Brevoort, of Bedford, Long Island, well known as the first ichthyologist in New York, and surpassed by no one in his knowledge of our marine species, I am under the greatest obligations. Through the kindness of Mr. John G. Bell, of New York, and Smith Herring, of Piermont, I was enabled to make a complete collection of the fishes of the upper Hackensack and Sparkill.

It must be understood that the present article does not aim at giving a complete account of the species referred to. Such descriptions of color as have been given were in every case taken from the fresh and living fish, the object being to place on record features not usually preserved in alcoholic specimens. Of the species whose colors were known not to fade or alter in spirits no notes of their peculiarities in this respect were taken, while the tints of others were so evanescent as to have escaped or altered before a description could be noted down.

Very little respecting the habits or history of the species has been added from other authors, nor does the nomenclature profess to be at all final as to critical accuracy. To have accomplished this latter object, would have required more time than is at present at my disposal, involving, as it would, the entire revision of American ichthyology generally. The names given are principally those of De Kay in his history of the fishes of New York, and can thus be readily identified.

As will be seen in the course of the article, several of the species collected appear new to science; to these I have been obliged to give names for the sake of proper reference, without at the same time furnishing a complete scientific description. This will, however, be supplied soon through another medium—want of time preventing its being done in season for the present Smithsonian Report. For important assistance in determining the species I am under many obligations to Mr. Girard.

The coast of New Jersey is well known to consist, for most of its extent, of a low beach with sand-hills, separated from the mainland by a wide strip of low meadows filled with small ponds, and intersected by creeks and thoroughfares, which traverse it in every direction. There is no rock or stone of any description, and, consequently, there is a deficiency in the plants and animals which frequent rocky localities. At Beesley's point there is scarcely a pebble of the smallest size to be seen.

The meadows are densely coated with grass, and are covered with water only during unusually high tides.

Beesley's point is situated at the mouth of Egg Harbor river, where it empties into Great Egg Harbor bay. The water is, of course, salt at

this point, though somewhat diluted by the volume of fresh water brought down by the river.

The distance from the mouth of the river, or head of the bay, to the inlet on the beach, is about two or three miles; the extreme width about the same, although extending into thoroughfares, through which a boat may be taken to Absecom on the one side, and to Cape May on other, without going outside of the beach. The mouth of the river is occupied by very extensive beds of oysters, which are celebrated for their excellent flavor. The bottom of the bay is in some part hard and shelly, in others sandy, or again, consists of a soft mud; the latter condition prevails near the shore, or wherever the current is of little strength.

There are numerous mud-flats or sand-bars in the bay, some of them bare at low tide, or nearly so, and occupied by various species of water-fowl. These flats, continuing to increase in height, and at length acquire a growth of grass which fixes still more the accumulating mud and sand, so that in time what was formerly a bar becomes an island elevated some feet above the water.

This transition is, in fact, so rapid, that many of the inhabitants now living have known islands several acres in extent to form within their own recollection.

The greater part of the bottom of the bay and of the thoroughfares, generally, is a soft mud, rich in organic matter, and covered with a profuse growth of *Zostera marina* and algæ of various species. Mr. Samuel Ashmead, who has been engaged for some years in studying the sea-weeds of our coast, has found a much greater variety of species at Beesley's point than Professor Harvey allots to the New Jersey coast. The water being generally shallow except in the channels, the sub-marine vegetation can be seen to great advantage, while sailing over the surface. The water becomes very warm during the summer, and supplies all the conditions necessary for the development of young fishes of many species. The young of all the large fish of the bay may thus be found in greater or less numbers along or near the shore.

The ponds in the meadows, like the waters of the bay itself, are generally muddy at the bottom, sometimes bare of vegetation, and sometimes covered with a thick growth. The fishes found in these ponds consist almost entirely of cyprinodonts of various species, with occasional specimens of *Atherina*, small mullet, or sticklebacks. The creeks likewise contain cyprinodonts, generally of different species from those of the ponds, with young fish of various kinds. Crabs and eels are found everywhere.

The line of beach is two or three miles from the mainland, and consists of a clear white sand raised into hills ten to thirty feet high, a few hundred feet from the water's edge. It is in the inlets at the ends of these beaches that the greatest variety of fish is to be found, particularly in the small indentations, protected from the roughness of the waves, and the bottom of which is covered with *Ceramium* or sea-cabbage.

Corson's inlet, frequently mentioned in the following pages, is situated at the southern end of Peck's beach, which begins directly oppo-

site Beesley's point at the entrance to the harbor, and extends to this inlet over a distance of about five miles.

The only fresh water near Beesley's point is Cedar Swamp creek. This stream, rising in a cedar swamp, and flowing with a very sluggish current, (the water of a chocolate color,) is cut off from the tide by a dam at Littleworth, three miles from the point. The bottom is very muddy. But little variety of fresh-water fish is to be found in this stream. Several species of *Esox*, two *Leuciscus*, one eel, three *Pomotis*, one each of *Aphredoderus*, *Labrax*, *Etheostoma*, and *Melanura*, and several cyprinodonts. The species are nearly all different from those found in the interior of Pennsylvania on the same latitude.

Another Cedar Swamp creek occurs on the opposite side of Egg Harbor river, in Atlantic county. In many respects it differs from that first mentioned in being of more rapid current, and the bottom at some distance from the tide-water dam consisting of sand or small pebbles. The water too in small quantity is clear, though where of considerable depth it appears almost black. Fewer species of fish were found here than in the other; the only additional one being the *Catastomus tuberculatus*.

Ludley's Run is a small run crossing the road to Cape May, about eight miles from Beesley's point; fresh at low tide but flooded at high water. The only fish found in it consisted of two cyprinodonts, and the *Gasterosteus quadracus*.

Note.—For the sake of avoiding a constant repetition, the initials only of the names of the fins are used. Thus, D. indicates the dorsal fin; C., the caudal; A., the anal; V., the ventral; and P., the pectoral.

LIST OF FISHES.

1. Labrax lineatus, Cuv. and Val.

Rock-Fish—Striped Bass.

Labrax lineatus, Cuv. and Val., Hist. Nat. Poiss. II, 79.—Storer's Report, p. 7.—DeKay, Fauna of New York, Fishes, 7, plate i, fig. 3.

The well known rock-fish, or striped bass, was not caught abundantly during my stay, although occasionally taken in the mouth of the river, and near bluff banks along the thoroughfares. In winter and spring they are captured in considerable numbers in seines, and of a weight extending to twenty or thirty pounds. Individuals of this size are, however, rarely met with. No young ones were seen, as they had not yet returned from the upper portion of the river. At Sing Sing, New York, a few weeks later, several sizes of young were taken.

The rock takes a bait readily, and, from the vigor of its actions, affords fine sport with the rod and reel; the fly is especially adapted to the capture of this species.

As is well known, the rock-fish is the associate of the shad and several species of herring, in a vernal migration from salt water to fresh, for the purpose of depositing their eggs. The development of their young is very rapid, as, when they return to the sea in the fall, they have already attained a length of about four inches; up to a size somewhat greater than this they exhibit decided indications of vertical dark bars, as in the yellow perch, but this fades out in a short time after being taken from the water.

The rock-fish is more abundant in Chesapeake bay and its tributaries than anywhere else to the northward. Here they occur all the year round, and are taken in great numbers. During their migration, they feed voraciously upon the herring bound on the same errand up the fresh water streams. These they ascend to a great height; in the Susquehanna, before the dams were built, reaching the forks at Northumberland, and possibly beyond. The falls of the Potomac offer serious impediments to their passage much above the city of Washington. Arrested in this way, they accumulate in considerable numbers, and afford great sport to the citizens of this place during spring and early summer. The late Mr. Webster was frequently to be seen patiently exercising that skill which made him eminent among the celebrated fishermen of the day.

Owing to its abundance, the rock is the chief staple of the Washington fish-market, where it is to be seen throughout most of the year. It is usually sold at a moderate price, and it is no uncommon thing to have the opportunity of purchasing one of 30 or 40 pounds for 75 cents.

Much interest has been excited in the experiments of Mr. R. L. Pell, of Pelham, Ulster county, New York, in reference to the breeding of rock-fish and shad in fresh waters. I have been kindly furnished by this gentleman with the following communication, which explains his method of stocking fish-ponds.

"I have succeeded in rearing the striped bass, known in our river as the Croton bass, thus: male and female were placed in a small pond, the water of which was salted twice each week until the small fry appeared, when salting ceased. Sixty days after, the old fish languished, and became excessively weak, in which state they continued to exist ten days, when they died. The small fry of both shad and bass grew rapidly, and when six weeks old were placed in a larger pond, and their progeny became fresh-water fish.

"I have a trout pond, which you probably did not see, in which I placed several hundred brook trout, varying from four to twelve inches in length. I was accustomed, for several years, to feed them frequently, and, to my surprise, they became very tame and confiding. On one occasion a large trout followed me around the pond, and so pertinacious was he, that if I suddenly passed around he crossed over; the next day he did the same thing several times, and, finally, I lifted him from the water and discovered a corroded hook in his mouth, after removing which I replaced him in the pond. How can you account for so much instinct in a fish?"

---

2. Labrax mucronatus, Cuv. and Val.

White Perch.

Labrax mucronatus, Cuv. and Val., Hist. Nat. Poiss. II, 86, plate xii.—Storer's Report, 8.—*Labrax rufus*, DeKay, Fauna of New York, Fishes, 9, plate iii, fig, 7.

The white perch was at no time during the summer taken in the bay, although in winter they occur there in great numbers, and are caught in seines, with rock-fish, eels, and flounders, which constitute the principal kinds of that season. They are very common in the Tuckahoe river and Cedar Swamp creek, Cape May county; indeed they exist in almost all the creeks of the salt meadows. The largest were taken in the perfectly fresh water of Cedar Swamp creek, above the tide-water dam, and exceeded a foot in length; very few, however, attain this size.

I found them abundant at Sing Sing, New York, in the brackish waters of Croton river; they are also very common, the year round, about Washington.

By setting a net across the current of a creek, at high tide, a great many white perch can usually be caught. I have seen many bushels taken out when the water was low. Great care must be exercised, however, lest the crabs, which are intercepted at the same time, eat holes in the net while nibbling at the fish gilled in the meshes.

The white perch bites readily at a hook, and is frequently caught in this way in great numbers. The flesh is very insipid and rather tough; in fact, the fish is one of the poorest of all the marine species of our coast.

The yellow perch, *Perca flavescens*, does not appear to occur at Beesley's Point.

---

3. Centropristes nigricans, Cuv. and Val.

Black Bass—Sea-Bass.

Centropristes nigricans, Cuv. and Val., Hist. Nat. Poiss. III, 14. —Storer's Rep. 9.—DeKay, New York Fauna, Fishes, 25, plate ii., fig. 5.

Like the porgee and several other species, the sea-bass or black fish, taken in Great Egg harbor, are of diminutive size, compared with those caught some distance out at sea. I do not remember any exceeding 20 ounces in weight, while most of them were not above half that size. They were seldom taken in large numbers, and in fact were rather difficult to catch at all, owing to their habit of nibbling at the bait without swallowing the hook. A very small hook, with a bait of corresponding proportions, was found to furnish the best mode of capturing them. Where they abounded, however, they generally put a stop to any successful fishing.

The black fish appears to be a summer visitor in Egg harbor, as I could not learn of its capture in winter. They were generally to be found off steep bars near the channels, very rarely near the shore. A few young ones, about an inch long, were captured at Corson's Inlet.

The black fish, as an article of food, may be reckoned among the best of the fishes of the coast. The meat is firm and very white, and the comparative absence of bones renders it possible to eat those of quite a small size.

Few authors, in their description of this fish, mention the broad, vertical, dark bands so conspicuous in the fish when first caught.

Color of young specimens.—Each scale on the body with a yellowish green or greenish white centre, and a border of darker. The sides, between the head and tail, crossed by five or six broad vertical bars of blackish, (constituted by the above mentioned borders,) not, however, obliterating the lighter centres; the borders of the scales between these bars are olivaceous. Head dark olive, the centres of the scales, the inferior border of the orbit, and several lines radiating from the eye towards the snout, rich green. Lower jaw blue, the extreme tips olive; isthmus inside the mouth and gill-covers, with the branchial arches, yellow, branchiostegal membrane brown. D. with the membrane olive green, brightest towards the edge; between each two adjacent rays of the dorsal are transverse bars of bluish white, and a larger number in the soft portion of this fin. These bars are slightly oblique to the rays, or, when the fin is erect, nearly parallel to the dorsal outline. Extreme margin of D. greenish white, with a narrow border of black on the soft portion; C. A. V. with membranes dark olive at base, then greenish white, and margined with black, the dark portions occasionally relieved by lighter patches of whitish or olivaceous, especially along the rays. P. olive green. Length 8 inches. August.

4. Pomotis obesus, Girard.

Pomotis obesus, Girard in Proc. Boston Soc. Nat. Hist. V, 1854, 40.

General color dark olive green, with six or eight vertical bars of darker on each side, covering a breadth of three or four scales. The skin at the base of the scales, in the space covered by these vertical bars, shows spots of golden purplish; cheeks with narrow lines and spots of the same and similar spots on the basal portion of the membrane of the vertical fins. A. and V. are glossed with metallic green on the interradial portion. Opercular flaps, rich velvet black, bordered (except behind) with a narrow line of golden purple; a crescent of the same on the basal half, the convexity anterior; opercles metallic green. P. transparent olivaceous. In some specimens a distinct vertical bar passes through the eye. In some, too, there is a shade of violet on each side, above the anal fins.

This species was only found in the Cedar Swamp creeks, Cape May county, and Atlantic county, among the splatterdocks, or in small runs or ditches. They were most abundant in muddy water, though occasionally occurring where it was quite clear. Fins nearly black.

This modestly colored species of sun-fish appears to be confined to the fresh water in the immediate vicinity of our Atlantic coast. I first detected it in the boggy brooks near Framingham, Massachusetts, and have since taken it at other points. It was very abundant in the Sparkill, near Piermont, New York, but does not appear to have been caught by any one but myself. Of its southern range along the coast I cannot speak, although a fish strongly resembling it is contained in a collection recently received from Georgetown, South Carolina.

---

5. Pomotis chætodon, Baird.

Banded Sun-Fish.

Pomotis chætodon, Baird.—General form sub-circular; greatest depth of body comprised less than twice its length; dorsal and ventral outlines regularly convex; profile descending towards the snout, which is obtuse. The mouth is small; the eye large, its diameter contained but three times in the length of side of head; spinous portion of dorsal extending over a base nearly equal to that of the soft portion, and almost as high; caudal subtruncated posteriorly and largely developed, and extending a little more posteriorly than the caudal; tip of ventrals extending beyond the three anal spines; pectorals rather small, their extremity reaching as far backwards as the ventrals.

D. X. 11; A. III, 12; C. 4 I. 8, 7, I. 3; V. I. 5; P. 10 or 11. Scales quite large; lateral line concurrent with the dorsal outline.

General color dirty white, with clouds of olivaceous; the tints clearer in smaller specimens; sides of abdomen silvery. Six well defined vertical bands of black on each side, covering each a breadth of two or three scales; the first passes through the pupil across the cheeks; the

second is posterior to the edge of the preoperculum, but interrupted in the middle so as not to cross the operculum; the third is posterior to the first ray of dorsal; the fourth posterior to the spinous rays of anal; the fifth posterior to the end of the dorsal and anal; the sixth passes across the base of the tail. Between the third and fourth bands are short bars, one proceeding from the dorsal, the other from the ventral outline in the same vertical line, and parallel to the others. This may in fact be described as an additional bar interrupted in the middle.

Fins greenish yellow, with mottlings of dark. Ventrals black centrally, yellow posteriorly, and deep red on the two anterior rays and intermediate membrane. Dorsal with the three anterior rays and their membrane black; the membrane between the third and fourth rays red. Pectoral plain.

In large specimens the tints are darker, and the ground color tinged with olivaceous. The red of the dorsal is not distinct. Length three inches.

Abundant in the muddy water of Cedar Swamp creek, Cape May county, New Jersey.

---

6. Centrarchus pomotis, Baird.

The Bass Sun-Fish.

Centrarchus pomotis, Baird.—General form elongated, subfusiform in profile; upper and lower lines regularly curved. A depression above the eye. Snout very much abbreviated; lower jaw longest. Mouth large; posterior extremity of maxillary extending to the vertical posterior rim of eye. Diameter of the eye contained about four times in the length of the side of head. Head constituting two sevenths of total length. Six rows of scales above the lateral line; twelve rows beneath. Lateral line concurrent with the dorsal outline. Spinous portion of dorsal quite low, and extending over a base twice as long as the soft portion. Caudal rounded posteriorly. Anal extending a little more backwards than dorsal. Five short anal spines. External soft ray of ventrals extending as a filiform appendage beyond the other rays, which do not reach the anterior margin of the anal. Tip of pectorals extending to a vertical which would intersect the vent.

D. XI. 12; A. V. 10; C. 4. I. 7. 6. I. 3; V. I. 5; P. 12 or 14.

Color.—Dark greenish olive, with three or four irregular longitudinal bands of dull greenish yellow, and occasionally cloudy spots of golden green. Sides of the head of this color, with three indistinct bands of dark olive. A dusky spot at the end of operculum. Iris purplish brown; cornea olive green. Fins quite uniform, very dark greenish olive, with darker margins, except the pectorals, which are light olivaceous, and the ventrals, the spinous rays of which are uncolored. Length six inches.

Some specimens may be better described as dark golden green, with longitudinal bands of dark olive, broken up by cloudings of greenish.

This species was only found in muddy water, or where there was considerable cover. They were stirred out from along the banks. I sometimes thought that they lay at times completely embedded in the mud. They were not rare in Cedar Swamp creek, and I caught a few in the Hackensack, Rockland county, New York.

---

7. Aphredoderus sayanus, Lesueur.

Aphredoderus sayanus, Lesueur.—DeKay, New York Fauna, Fishes, 35, plate xxi, fig. 62.

Prevailing color dark olive brown, with occasional obscure dots of lighter. Abdomen and under surface of the throat and head, with the sides of the latter, yellowish, with fine punctations of greenish brown indistinctly visible on the sides. A vertical dark bar beneath the eye. Iris silvery, dotted with black.

D. C. and A. dark olive, with darker margin and base. This character on the tail shows as a vertical bar, parallel to which is another near the base of the tail. P. olive, V. greenish yellow, with cloudings of dusky towards the tip. Lateral line lighter than the ground color.

Largest specimens four and a half inches. Ditches of Cedar Swamp creek, Cape May county.

This species was very abundant in a small branch of Cedar Swamp creek, above Littleworth, where many were taken in a short time.

The size above given is probably a maximum one, as most I have seen from other localities are considerably less. The species is little known to naturalists, although occurring in many streams on the Atlantic coast.

---

8. Sphyræna borealis, DeKay.

Northern Barracuda.

Sphyræna borealis, DeKay, New York Fauna, Fishes, 39, plate lx, fig. 196.

Nothing specially noteworthy was observed as to the habits of this diminutive representative of the ferocious barracuda of Florida. None of the specimens caught, in fact, exceeded four inches in length. They were taken from a small cove at Corson's inlet; a few of them were found among the grass at the mouth of the river.

9. Prionotus pilatus, Storer.

Flying Fish.

Prionotus pilatus, Storer, Proc. Bost. Soc. Nat. Hist. II, 77; also, Hist. of the Fishes of Mass. 20, plate vi, fig. 1.

Above mottled olive and reddish brown, with three or four large quadrate spots of darker across the back. The reddish brown spots predominate along the lower part of the sides, in some cases almost forming a longitudinal stripe. Abdomen and inferior part of the body generally reddish white. Head reddish brown, cheeks coppery. Branchiostegal membrane and inside of mouth behind, brownish black. Pupil violet; iris olive-green externally, brassy or coppery internally. Anterior dorsal olivaceous dusky at base, with two or more interrupted bars of pale bluish nearly perpendicular to the rays. A distinct dark spot on the membrane, between the fourth and fifth dorsal spines. Posterior dorsal transparent, mottled or coarsely vermiculated with olivaceous. P. very dark olive-green, with reticulations of a lighter color; chalk-white on the posterior edge of the lower surface. A. C. V. with the pectoral processes reddish brown, brightest along the margin; the former white along the base. Length six inches.

This species was very abundant, and frequently taken with the hook, when its disentanglement proved to be a matter of some danger, on account of the spines of the head. In one instance a man was confined to the house for two weeks in consequence of a puncture received in this way.

When caught, this fish commences a loud croaking or barking, the sound apparently produced in the abdominal region. This is so loud and constant that in hauling a large seine the presence in the net of a single specimen of this gurnard, however small, could generally be determined by the peculiar sound emitted. For this reason it is sometimes called pig-fish by the inhabitants.

The pectoral processes are used as organs of progression, the fish dragging itself slowly upon the bottom by their aid, or raising itself up and resting on their tips. In swimming, or resting, the broad pectoral fins are generally spread out horizontally to their fullest extent—presenting a very beautiful and striking appearance, and closely resembling the wings of some butterfly.

The flesh is sweet, white, and palatable, though on account of its comparatively small size this fish is seldom eaten. Specimens caught on the surf or out at sea are usually much larger than those in the bay, sometimes exceeding a foot in length. It is said to be only a summer visitant.

10. Acanthocottus virginianus, Girard.

The common Sculpin.

Acanthocottus virginianus, Girard, Proc. Bost. Soc. Nat. Hist. III, 1850, 187.—*Cottus virginianus*, Storer, Rep.—DeKay, New York Fauna, Fishes, 51, plate v, fig. 13.

A dried specimen of a sculpin was given me by Mr. Ashmead, which, unfortunately, was mislaid and lost. It was taken in the winter, but does not seem to be abundant.

---

11. Boleosoma fusiforme, Girard.

Darter.

Boleosoma fusiforme, Girard, Proc. Bost. Soc. Nat. Hist. V, 41.

The only specimens procured were taken from Cedar Swamp creek, at Littleworth, where it was seen lying motionless at the bottom of the water, darting off swiftly when disturbed.

---

12. Gasterosteus quadracus, Mitch.

Stickleback.

Gasterosteus quadracus, Mitch., Trans. Lit. and Philos. Soc. 430, plate i, fig. 11.—DeKay, New York Fauna, Fishes, 67, plate vi, fig. 18.

Reddish olive above; sides with a broad but ill-defined band of mottled dark brown, of irregular outline, extending from the snout to the tail, with finer mottlings of the same above and below. This is sometimes broken up into irregular mottlings of dark and lighter brown, with better defined and larger blotches of darker interspersed.

Region of lateral line generally lighter; lower part of cheeks and under parts yellowish silvery; fins, transparent with dark mottlings on the rays; ventrals red behind the anterior spine.

A few specimens were taken, at intervals, in the salt-ponds in the meadows, or among the grass and sea-cabbage of the bay. They were most abundant in Ludley's run, at the crossing of the Cape May road; where the water is perfectly fresh at low tide, and brackish at high water. Here they kept along and underneath the bank, whence they were dislodged with considerable difficulty. This species was also taken in the brackish waters about Sing Sing, New York.

13. Leiostomus obliquus, DeKay.

The Lafayette.

Leiostomus obliquus, DeKay, New York Fauna, Fishes, 69, plate lx, fig. 195.

The "Cape May Goody" of the Jersey coast, so called from its great abundance at Cape Island, is very rarely taken in winter, and appears to be rather a summer visitor. It makes its appearance, in large numbers, at Cape May, in August; the first run being composed of quite small individuals, and the larger ones succeeding these. They enter the creeks in crowds, and are caught there in company with the white perch. When perfectly fresh they are most delicious—excelled in flavor by no species on the coast. Their usual size in the bay is about six inches, though occasionally caught measuring ten.

This species is somewhat capricious in its visits to the northern shores; intervals of years sometimes intervening between periods of abundance.

From a coincidence of one of these runs and the last visit of General Lafayette to America, they are known by his name about New York.

---

14. Otolithus regalis, Cuv. and Val.

Weak Fish—Squeteague—Blue Fish.

Otolithus regalis, Cuv. and Val., Hist. Nat., Poissons, V, 67.—DeKay, New York Fauna, Fishes, 71, plate viii, fig. 24.

Young.—Back greenish, shading into yellowish silvery, with purple reflections on the side. In some specimens there are indications of subvertical blotches on the sides. None of the spots of the adult are seen until the fish exceeds 4 inches in length. D. and C. dusky; P. V. A. yellow; Iris, silvery. Length, 4 inches.

The adult, when first caught, in addition to the markings which are retained in alcohol, presents all over a rich tint of purplish red, which very soon fades out into a dull silvery.

This species, known as blue fish at Beesley's point, weak fish at New York, shecutts at Greenport, Long Island, and trout in Philadelphia and Baltimore, is the species most abundant of all those considered as game by the fisherman. It makes its appearance early in the spring, and leaves for the sea late in the autumn, attaining its period of greatest abundance towards the end of July. It is very easily captured with almost any bait—clam, soft crab, or pieces of fish. Indeed, some of the best sport I ever witnessed with this fish was had by using the eyes of those already caught as bait.

No species on the coast shows so large a count in a successful day's fishing as the weak fish, it being not uncommon for a single boat of three or four men to take from 150 to 250 in an hour or two. When

caught in such numbers, however, the size is not great, perhaps not averaging three-quarters of a pound. The large specimens are generally scattering in their appearance, being seldom taken in numbers. These fish moves about in shoals of greater or less extent, usually swimming pretty near the surface, and requiring for their capture a line leaded very lightly or not at all. They take the bait at a snap, seldom condescending to nibble, thus requiring the line to be kept taut and ready to haul in at a moment's warning. It is, however, only for a short time that they bite voraciously, the run seldom lasting more than one hour.

These fish keep much in the channel ways of the bay and river, when moving, but during ebb-tide, they settle in the deep holes in great numbers, remaining until flood, when they again sally forth. The old stagers are always on the alert to move up to the places of this kind well known to them, and, anchoring their boat, wait patiently for the fish. After passing some time without a nibble, the sport suddenly begins, and, for half an hour to an hour, the excitement of hooking a fish almost the instant the line is dropped, is kept up, when it again as suddenly ceases by the disappearance of the game. The most noted place of this kind about Great Egg harbor is Molasses point, already referred to, where the current is very strong during height of tide, and the great depth of water scarcely extends for one hundred yards.

During the night the weak fish runs much up into the larger creeks of the salt meadows, and, by putting a net across the mouths of these, the weak fish, king fish, and some other species may be penned up and caught in great numbers. In any attempt to retain specimens of moderate size, or of the small species generally, great annoyance is experienced from the crabs, *(Lupa dicantha,)* which are exceedingly abundant, and, arrested by the same operation, leisurely set themselves to work in catching the fish gilled in the net. In so doing, they cut the meshes very badly, in fact some of my best seines were almost totally ruined by them.

The weak fish appears to require, during the summer, a slight dilution of fresh water in the marine element it inhabits, as it concentrates in large numbers about the mouths of rivers in dry weather.

During the excessive drought of the past summer, it was observed that the weak fish was taken much higher up rivers than ever known before. They disappeared almost entirely from Beesley's point about the middle of August, and could only be heard of towards Tuckahoe and higher up. The fishermen prayed devoutly for rain to weaken the waters of the bay, and bring back the weak fish.

At Sing-Sing, New York, and even much higher up the North river, they were taken in numbers in August and September.

The young weak fish were very abundant along the edges of the bay and in the small creeks, of sizes not exceeding four or five inches. It is quite probably that they spawn early in the season, and that these are the fry of the year. At this time they are broadly banded vertically, and, with their much compressed body, would never be referred to the weak fish but for the two prominent canines of the upper jaw. A few only had the spots of the adult.

As a table fish, this species is very much inferior to almost any other

captured on the coast. It looses its rigidity soon after being taken, becoming soft and flabby. It can hardly be used whole a few hours out of the water, and is usually served up cut into short pieces. The flesh, when cooked, is somewhat gelatinous and translucent, very different from the snowy opacity of that of the king fish.

As usual, the fish of this species taken outside in the surf, either with the line or by hauling the net, are much larger than the common run of those in the bay and rivers. The largest I have ever seen weighed about five pounds, though they are said greatly to exceed this occasionally.

When taken, this species makes a peculiar croaking, somewhat like that of *Prionotus*. This is said at times to be heard above water when the fish is at the bottom.

---

15. Corvina argyroleuca, Cuv. and Val.

The Silver Perch.

Corvina argyroleuca, Cuv. and Val., Hist. Nat. Poiss. V, 105.—DeKay, New York Fauna, Fishes, 74, plate xviii, fig. 51.

A single specimen only of the adult fish was taken during my stay at Beesley's point. It was caught in the bay by Captain Townsend Stites, and seemed to be unknown to the fishermen.

The young, however, were very abundant in the grass along the edge of the river, of various sizes, not exceeding three inches. They had no markings of any kind, the sides being of a uniform yellowish white.

It is not unfrequently brought to market in New York, where it is known as silver perch.

---

16. Umbrina alburnus, Cuv. and Val.

The King-Fish.

Umbrina alburnus, Cuv. and Val.—DeKay, New York Fauna, Fishes, 78, plate vii, fig. 20.

This species is known at Beesley's point as the hake, a name derived probably from its possessing one barbel at the chin, in common with the *Phycis americana*, which bears the same appellation with more propriety. About New York it is called king-fish, and its congener at the south is known as whiting. Everywhere it bears the deserved reputation of being one of the finest fish caught, the sheepshead (*Sargus ovis*) scarcely excepted. Of late years this fish appears to have become quite rare about New York, but they are still abundant on the Jersey coast. At Beesley's point they come next in the count of a day's

sport to the weak fish, although thirty or forty may be considered as a first rate catch for a single boat and tide.

The king-fish makes its appearance in the bays early in the spring, leaving in the fall, and appears to observe much the same periods with the weak fish. Like this species, it is fond of a slight mixture of fresh water, running up the mouths of rivers and ascending in proportion to the duration of dry weather.

During the past summer several were taken at Sing Sing, New York, where they had previously been unknown.

The young fish were exceedingly abundant in the river at Beesley's point, on sandy bottom, as well as in the surf, hundreds being taken at a single sweep of a small net. The smallest were about an inch long, probably the spawn of the spring. As usual, the largest specimens of the fish were caught with nets in the surf, though none that were seen exceeded fifteen inches in length.

The king-fish keeps much in schools, in or near the bottom where it is sandy or hard, preferring the edge of channels or the vicinity of sand-bars. They keep about oyster beds, and when oysters are being taken up frequently congregate in large numbers about the boats in eager quest of the worms and other minute animals dislodged by the operation. They bite very readily at clams, crabs soft or hard, and at times make little objection to pieces of fish. The best time for capturing them is on the young flood.

Like the weak fish they at times run up the small creeks in the salt meadows at night, and are taken by intercepting their return with the falling tide. This, however, is by no means so common a habit as with the other species.

The eastern range of the king fish is not extended. Dr. Storer records a single specimen only as having been taken in Boston harbor.

---

17. Pogonias fasciatus, Lacép.

The Banded Drum.

Pogonias fasciatus, Lacép., Hist. des Poiss.—DeKay, New York Fauna, Fishes, 81, plate xiv, fig. 40.

Sides yellowish silvery, with six or seven broad, dark, vertical bars between the head and tail. D. and C. dusky towards their borders, the anterior D. quite dark; P. colorless; V. and A. yellow.

The young fish of this species were found very abundantly during August in the small bays along the shore about Beesley's Point. Few were seen in the rivers.

---

18. Lobotes emarginatus, B. and G.

Lobotes emarginatus, B. and G. Body elongated, subfusiform in profile; head subconical, contained a little more than three times in the

total length. Posterior extremity of maxillary extending to the vertical line of the anterior rim of pupil; eye circular; its diameter contained about four times in the length of side of head; external soft ray of ventrals continued into a membranous thread extending beyond the other rays, but not reaching the anal fin. Caudal emarginated posteriorly.

D. X. 14; A. III. 8; C. 4, I. 8, 7, I. 3; V. I. 5; P. 15.

Scales well developed; in six rows above lateral line, and fourteen to fifteen below.

General color light olive green, with narrow, well defined longitudinal lines of purplish brown along the sides; one through the centre of each row of scales. These lines, above the lateral line, are parallel to it; below, they are somewhat oblique, ascending behind. A narrow, well defined horizontal line of steel blue passes beneath the eye, tangent to the orbit; a broader one of violet extends through the pupil, parallel to the upper outline of the head.

D. light olive green, the distal half of the spinous portion dull purplish; the membrane elsewhere mottled with purplish brown. C. with rays yellow and red, the membrane mottled with purplish.

A. and V. purplish red anteriorly, yellow behind, the former somewhat mottled. P. greenish yellow. A narrow margin of D. A. and P. pale violet. Length, three inches..

A few specimens were taken, in August, among the grass along the river.

---

19. Pagrus argyrops, Cuv. and Val.

The Big Porgee.

Pagrus argyrops, Cuv. and Val., Hist. Nat. des Poiss. VI, fig. 164.—DeKay, New York Fauna, Fishes, 95, plate ix, fig. 25.

About six vertical broad bars of dark purplish brown on each side between head and tail; the first just anterior to the dorsal fin. The intermediate space, when viewed directly, appears of a brownish olive and greenish white mixed; but, held a little obliquely, this resolves into a silvery tint, with well defined longitudinal lines of purplish, a line for each row of scales, and usually along the adjacent edges. Above the lateral line these lines are oblique, and nearly parallel with the dorsal profile anterior to the D. fin. Head above (excepting a lighter bar beneath the eyes), operculum, and an oblique bar beneath the eye rich purplish brown. Back along the dorsal fin and a space on each side of the nape with reflections of rich metallic green. A dark spot on the base of the pectoral bones. Belly white, closely punctate with dark brown.

D. with the rays silvery, the membrane mixed green and purplish brown, the margin clear dark reddish brown. C. brown at base, then greenish, then violaceous white, and ending in dark purplish brown; these colors in rather ill defined V-shaped bands, parallel with the

posterior margin. Extreme tips of caudal lobes of a brighter brown; A. green and purplish brown, bluish towards the edge, which itself is milk white. V. similar. P. transparent, tinged with dusky. Iris dark reddish brown. Length, six inches.

After death, and, indeed, most specimens when fresh caught, exhibit but faint traces of the vertical bars, the sides being silvery, with longitudinal lines of brassy yellow. Iris silvery.

This species is caught with a hook, in water from six to twelve feet deep. They feed on the bottom, and are very destructive to bait, which they nibble off from the large hake and blue fish hooks in a very short time. Few exceeded six inches.

The porgee did not make its appearance in Egg Harbor bay until towards the middle of August, although said to be found at sea at an earlier period. As usual, the specimens were smaller than those taken outside the beach, though exhibiting the same beauty of color. Very few descriptions or figures convey any idea of the variety of delicate tints on this beautiful fish, which fade in a short time after death into a uniform silvery hue.

After the arrival of the porgees in the bay and mouth of the river, they become very troublesome by their great numbers and the destruction of bait caused by their incessant nibbling. A large hook will be cleaned entirely in a moment, while all efforts to catch the depredator prove vain. The only way of taking them is to use a fine line, and very small minnow hooks, baited with small bits of clams, fish, or other food. These will be swallowed boldly, and, as they bite voraciously, large numbers can be taken in a short time. It is only necessary to throw the line out to its full extent, and then at once haul it in slowly, during which movement the bait will generally be seized. A single clam, chopped fine, may serve to catch twenty or thirty.

Quite large porgees are taken about Greenport, Long Island, in very great numbers, with seines. The usual ground is on the east side of Shelter island, where a fishing smack will frequently be loaded at a single haul. During the months of August and September these fish constitute the principal stock of those sent to the New York market over the Long Island railroad. The flesh of the porgee is excellent when fresh—scarcely surpassed by that of any other fish on the coast.

Genus EUCINOSTOMUS, B. and G.

Genus *Eucinostomus*, B. and G.—This genus has been established to include a species of the Menid family, possessing the following generic characters: Mouth small and very protractile; when protruded presenting a subconico-tubular appearance; lips thin; palate and tongue toothless; opercular apparatus without either spines or serratures. The second spine of the anal itself is less developed than in the genus *Gerres*, a genus to which the present one bears a close affinity.

20. Eucinostomus argenteus, B. and G.

Eucinostomus argenteus, B. and G.—Mouth very small; when retracted the posterior extremity of maxillary extends slightly beyond the vertieal of anterior rim of the eye; base of spinous portion of dorsal equal in length to that of the soft portion; posterior extremity of soft dorsal rays extending a little more baekwards than those of the anal fin.

D. IX, 10; A. III, 7 or 8; C. 5, I, 8, 8, I, 4; V. I, 5; P. 13.

Head forming about one fourth of the whole length; eye large, its diameter eontained nearly three times in the length of the side of head; seales large; ground eolor silvery, with transverse fasciæ of a darker hue in immature specimens.

This speeies was quite abundant in the latter part of August, in the river and small bays. None were taken exeeeding three inches in length.

---

21. Cybium maculatum, Cuv. and Val.

The spotted Cybium—Spanish Mackerel.

Cybium maculatum, Cuv. and Val., Hist. Nat. Poiss. XIII, 181.—DeKay, New York Fauna, Fishes, 108, plate lxxiii, fig. 232.

Of this fish but two speeimens were taken during my stay at Beesley's point, and the speeies is searcely known to the fishermen. It was more abundant at Greenport, Long Island; and in the Peeonic bay, towards Riverhead, four hundred were eaught at one haul of the seine. The flesh is exeellent, having mueh the flavor of true maekerel, only a little softer and richer.

The fish bears a high price in the New York market, where it has been but reeently known. It has been more abundant off our eoast generally this season than ever before; and in the lower part of the Potomae, numbers have been taken and salted down. They may frequently be found in this state in the Washington market, and readily reeognised by the round yellow spots on the sides, and the size so mueh larger than that of the eommon salted maekerel. The posterior portion of the body, to the base of the tail, is slenderer and much more elongated than in the other speeies.

---

22. Lichia carolina, DeKay.

Lichia carolina, DeKay, New York Fauna, Fishes, 114, plate x, figure 30.

Bright silvery, with bluish refleetions on the back and upper part of sides; dorsal transparent, dusky towards the tips of the longest soft

rays. C. A. yellowish towards their margin—the latter brightest anteriorly; V. white, tinged with yellow; P. brownish anteriorly. Iris silvery. Length, 5 inches.

This species was very abundant in the edge of the surf on the beach, moving about slowly in small schools. Occasionally they were seen in great numbers in the small slues running up into the beach, where several bushels were frequently taken in a sweep of ten yards with a seine eight feet long. They are most delicious as a pan-fish, and give very little trouble to fit them for cooking, not requiring scaling and scarcely gutting. The only preparation needed is to cut off the head a little obliquely, which will remove all the intestines.

---

23. Lichia spinosa, Baird.

The spinous Dory.

Lichia spinosa, Baird.—*Trachinotus spinosus*, DeKay, New York Fauna, Fishes, 117, plate xix, fig. 53.

Similar in colors to the *L. carolina*. The anterior yellow of the dorsal and anal is, however, brighter—even gamboge yellow; basal half of the anal, dusky; ventrals, chalk white, yellow anteriorly. Length, 2½ inches.

Caught in very small numbers with *L. carolina*.

---

24. Caranx chrysos, Cuv. and Val.

The yellow Caranx—Yellow Mackerel.

Caranx chrysos, Cuv. and Val., Hist. Nat. Poiss. IX, 97.—DeKay, New York Fauna, Fishes, 121, plate xxvii, fig. 85.

Sides bright wax color, becoming olivaceous along the back; a darker tinge of yellow on the cheek and operculum than elsewhere. In some lights there is a violet reflection on the back. A black spot on the upper part of the posterior edge of the operculum. Dorsals, dark olive green, dusky along the margin; C. dark wax yellow at the base, then lighter yellow—the tips blackish brown; A. dark wax yellow, the margin and spinous portion opaque white; V. white, yellowish centrally; P. greenish yellow. Length, 8½ inches.

Only one specimen of this fish was seen during my stay. It was caught in the bay with a hook. A few more were found among the porgees at Greenport, Long Island.

25. Argyreiosus capillaris, DeKay.

The Hair-finned Dory.

Argyreiosus capillaris, DeKay, New York Fauna, Fishes, 125, plate xxvii, fig. 82.

One specimen was taken in August while hauling the seine in the surf.

---

26. Temnodon saltator, Cuv. and Val.

The Blue Fish—Horse-Mackerel—Skip-Jack.

Temnodon saltator, Cuv. and Val., Hist. Nat. des Poiss. IX, 225, plate 260. DeKay, New York Fauna, Fishes, 130, plate xxvi, fig. 81.

The blue fish, or horse-mackerel, as it is called at Beesley's point, arrives in the bay early in the spring, accompanying the weak fish in its migration and preying habitually upon it. It is not usual to take them of large size during the summer; later in the season, however, specimens of two and three pounds are not unfrequently captured. Their usual size in August was from eight to twelve inches. The very young ones were found abundant at Corson's inlet, measuring two or three inches in length. At this age they are much more compressed than afterwards.

The blue fish is one of the most voracious fishes on the coast. It bites readily at any object drawn rapidly through the water, as a bone squid, or metal spoon, minnow, white rag, and, in fact, any conspicuous bait. They are generally caught by trolling on the surface of the water, best by sailing back and forth across a channel way, when the wind and tide are in opposite directions. Unless the line is armed with quill near the hook, or wired for a short distance, it is cut off by the sudden snap of their nipper-like teeth, this species ranking with the shark in the facility with which it takes off the hook.

The blue fish keeps near the surface of the water, and frequently leaps some distance into the air. It preys habitually upon the weak fish, and its ravages among the latter species seem to have diminished greatly its numbers off the coasts of New York and New England. It finds, likewise, an easy prey in the schools of Mossbunkers, among which it is said to commit such havoc that the gulls are attracted far and near in quest of the bits of flesh and mutilated fish which float on the surface.

Such congregations of birds often indicate to the fishermen the presence of blue fish on his grounds.

This species, like the weak fish, runs up the mouths of rivers even to where the water is comparatively fresh. Small ones were very abundant at Sing Sing the past summer, and were caught readily from the rocks or along the wharves. They were known as white fish.

They are taken in large numbers in the Potomac river as far up as Acquia creek, as well as in Philadelphia, where they are called tailors.

---

27. Peprilus triacanthus, Cuv.

Harvest-Fish.

Peprilus triacanthus, Cuv., Règne Anim. 3d ed.—*Rhombus triacanthus*, DeKay, New York Fauna, Fishes, 137, plate xxvi, fig. 80.

Several specimens were taken in a net at Corson's inlet. They were occasionally seen swimming slowly in small schools close to the steep banks of the inlet. The flesh is said to be tolerably well flavored, though less so than that of many other scombroid species of the Jersey coast.

---

28. Atherinopsis notatus, Girard.

The Silverside—Sand-Smelt.

Atherinopsis notatus, Girard, Proc. Acad. Nat. Sc. Philad. VII, 1854, 198.—*Atherina notata*, Mitch.—DeKay, New York Fauna, Fishes, 141, plate xxvi, fig. 88.

This diminutive species may be said almost to out-number all others on the coast, the cyprinodonts not excepted. It is found quite abundantly everywhere throughout Egg Harbor bay, though of small size; but it is along the sands of the beach and about the inlets that its vast schools are met with. Here they come in with the rising tide, especially when it flows over an extensive tract of sands bare at low water or with only a few pools. At times the water will appear in a state of constant agitation with the attempts of the fish to keep in the edge of the tide as it rolls on, and bushels can be taken in a short time merely with scoop-nets. Several parties, provided each with a fine meshed seine of twenty or thirty feet in length, could readily fill a wagon in a little while. Although no use is made of these "silver sides" on our coast, except as bait, there is no doubt that, potted and prepared as sardines and anchovies, they would be excellent.

With the exception of *Hydrargira flavula*, which is found in large numbers in the same localities, few other fish are met with in these large schools of atherinas. A few scattered *Cyprinodon ovinus* and small mullets only are to be seen. The maximum size to which the atherina attains is about six inches, although fish of this length are seldom caught in the bay. The flesh is nearly translucent and very sweet; and no preparation being required to fit them for the frying-pan,

they might, though comparatively small, be eaten more frequently than they appear to be.

The silver-side, or sand-smelt, as it is called further east, makes an excellent bait for blue fish, weak fish, and, in fact, almost any other species. It must constitute the chief article of food for the larger fish on our coast, as it is found everywhere, even far up the mouths of rivers. It was very abundant at Sing Sing. In fact, I have seldom drawn a net anywhere in salt water or brackish without seeing it. It is a constant associate of the cyprinodonts in the salt ponds and meadows. It bites readily at a hook, although very seldom swallowing the bait owing to the smallness of its mouth.

---

29. Mugil albula, Linn.

The White Mullet.

Mugil albula, L.—DeKay, New York Fauna, Fishes, 146.

Back dark bluish black; sides lustrous silvery; beneath opaque white; a dark bluish black spot on the body, at the base of the pectoral fin; iris silvery, with a yellowish tinge above, as also on the operculum; D. and C. dark bluish on the membrane, especially towards the extremities; P. less strongly marked in the same manner; V. and A. opaque white, the latter with a few brown dots on the rays. Length 4½ inches.

Although small mullets were caught in considerable numbers in the creeks and about the inlets, none of large size were seen. The larger ones do not arrive until September, when they are said to be abundant. They then come close to shore among the grass, and run up the creeks in numbers, even where the water is shallow. When intercepted in a seine they leap over the upper edge with great readiness, one following the other, like a flock of sheep. Their maximum size is from eight to ten inches.

This fish becomes extremely fat, so much so as to require no grease in frying. The flesh is said to be very palatable, though rather rich. The large mullets do not remain long in the bay, generally returning to the sea in the fall. A few, however, are said to remain all winter in the salt ponds.

---

30. Gobius alepidotus, Bosc.

The variegated Goby.

Gobius alepidotus, Bosc.—DeKay, New York Fauna, Fishes, 160. plate xxiii, fig. 70.

Translucent olive green, with seven or eight vertical lines of lighter along the side; vertical fins, mottled with dusky spots, arranged in series transverse to the rays. Length one inch.

A few specimens only of this rare fish were taken in the grass along the beach of the river.

31. Batrachus variegatus, Les.

Toad-Fish—Oyster-Fish.

Batrachus variegatus, Les., Journ. Acad. Nat. Sc. Philad. III, 398.—DeKay, New York Fauna, Fishes, 171.

Body olivaceous, closely but rather coarsely vermiculated with darker; three or four quadrate spots across and along the back; iris greenish yellow, with four broad double radii of greyish; fins reddish brown towards the borders, their general color light olivaceous; C. and P. with well defined bands of darker, transverse to the rays; D. and A. with similar bands disposed obliquely towards the rays, the angle anterior; a dark spot on the anterior dorsal; V. and inferior parts of body reddish white—in large specimens, the latter yellowish, with dark blotches. Length six inches.

The toad-fish, or, as it is called at Beesley's point, the oyster-fish, on account of its frequenting the oyster beds, is one of the fishermen's pests, from its great abundance, and pertinacity in taking the hook baited for nobler game. Few fish are more repulsive in appearance than this species, with its large, flattened head, broad mouth, laciniated processes or fringes about the jaw, goggle eyes, and slimy body. It will live a long while out of water, snapping at the finger even when almost dried up. It is capable of inflicting quite a severe bite, and is always handled with a great deal of caution.

The eggs are said to be laid on oyster shells, or between their empty valves, at Beesley's point, in the entire absence of stones or pebbles, which constitute the usual place of deposite. An artificial pile of stone near Chattin's tavern is a favorite locality with them. The eggs are about the size of number 6 shot at first, but enlarge to the bulk of a pea; their color is a bright yellow. The fish watches its nest very vigilantly, and can scarcely be driven away, snapping at the finger or a stick, and when forcibly removed returning with the first opportunity.

The flesh is said, by those who have been able to overcome their aversion to the fish, to be very sweet and palatable.

The toad-fish seldom comes very near shore, few having been taken in the hauling of small seines. I have never seen it up the small creeks.

---

32. Tautoga Americana, Cuv. and Val.

Tautog—The Black Fish.

Tautoga americana, Cuv. and Val., Hist. Nat. des Poiss. XIII, 293.—DeKay, New York Fauna, Fishes, 175, plate xiv, fig. 39.

The tautog, smooth black fish, or chub, as the species is indifferently called, was not abundant at Beesley's point during the past summer, although their number is said to be greater in the fall. They are caught off the steep banks, in the channel-ways and the thoroughfares.

The flesh is not very remarkable for its exeellenee, being greatly surpassed by several other speeies.

Owing to the toughness of the skin and the firm adhesion of the seales, it is eustomary to skin the tautog before eooking, whenever of suffieient size to permit it.

Young fish of this speeies were taken in eonsiderable numbers in the river and about the inlets, when hauling the nets. Their color was generally of a light olive green.

---

33. Ailurichthys marinus, B. and G.

Sea Cat-Fish.

Ailurichthys marinus, B. and G., Proe. Aead. Nat. Se. Philad. VII, 26.—*Galeichthys marinus*, De Kay, New York Fauna, Fishes, 178, plate xxxvii, fig. 118.

The sea-eat or ehannel-eat, was oeeasionally taken with the hook in the channel of the river. Nothing speeially was learned of its habits. The flesh is very indifferent, being eoarse and rank, tasting mueh like that of small sharks.

---

34. Leucosomus americanus, Girard.

Dace.—Wind-Fish—Shiner.

Leucosomus americanus, Girard in Storer, Hist. Fishes of Massaeh. 117, plate xxi, fig.—*Abramis versicolor*, DeKay, New York Fauna, Fishes, 191, plate xxxii, fig. 103.

This species was very abundant in the fresh waters of Cedar Swamp ereek and Cedar ereek, two streams emptying into the Egg Harbor river on opposite sides. None were seen exeepting in perfeetly fresh water above the tide dams. They were in eonsiderable numbers, as being the prineipal representative of the eyprinoids in the New Jersey streams. This speeies is found everywhere in the streams of the Atlantie eoast to Maine. Nothing of speeial interest was noted as to its habits.

---

35. Catostomus gibbosus, Les.

The Horned Sucker—Chubsucker.

Catostomus gibbosus, Les.—*Labeo gibbosus*, DeKay, New York Fauna, Fishes, 194, plate xxxii, fig. 101.—*Catostomus tuberculatus*, Les.—DeKay, ibid, 199, plate xxxi, fig. 97.

This was the only sueker found in the Cedar creeks, nor is any other speeies believed to oeeur there. It is everywhere eonstantly associated

with the *Leucosomus americanus;* and these, with a small species of *Leuciscus* allied to *L. hudsonius*, constitute almost the only cyprinoids of the fresh waters on our coast. I have seen no other species from New Jersey to Maine in streams emptying directly into the ocean or into brackish waters, except when quite removed from the salt water.

---

36. Melanura pygmæa, Agass.

Mud-Fish.

Melanura pygmæa, Agass.—*Leuciscus pygmaeus*, DeKay, New York Fauna, Fishes, 214, plate xlii, fig. 134.

Only one specimen of this species was obtained, caught in a muddy ditch along side the fresh waters of Cedar Swamp creek. Of the five or six species of this genus indicated by Professor Agassiz, all appear to have the same peculiarity of living almost entirely in mud. A locality, which, with the water perfectly clear, appears destitute of fish will perhaps yield a number of mud-fish on stirring up the mud at the bottom and drawing a seine through it. Ditches in the prairies of Wisconsin, or mere bog-holes apparently affording lodgment to nothing beyond tadpoles, may thus be found filled with melanuras. Their usual associates in such places in the west are *Gasterosteus inconstans*, Kirt.

I found none on Long Island, although they doubtless occur in the muddy streams about Riverhead. Mr. J. C. Brevoort, obtained a single specimen near Bedford, and Dr. Ayres some at Brookhaven. This genus appears to be confined to a few points near brackish and salt waters, and to the vicinity of the great lakes; they are especially abundant on the plateaus dividing the waters of the lakes from those of the Mississippi. I have caught them all around Lakes George and Champlain; on the American shores of all the great lakes except Lake Superior; and on their dividing ridges, as already stated, as far west as the Mississippi, in Wisconsin. They have, however, not yet been detected much south of this region in the interior.

This species of *Melanura* is probably identical with *Leuciscus pygmæus* of DeKay, an unfortunate name, as it belongs to an entirely different family than the Cyprinidae, and attains to a larger size than the rest, much larger than many of the *Leucisci*. Specimens taken in Rockland county, New York, and in the same localities whence Mr. J. G. Bell obtained those sent to Dr. DeKay, measure nearly six inches in length. I procured a large number of them during the past summer.

---

37. Fundulus zebra, DeKay.

Fundulus zebra, DeKay, New York Fauna, Fishes, 218.

Above, dark olive green, lighter on the sides; on the throat and belly greenish white; 12 to 15 vertical bands on each side of greenish

white, with spots of greenish golden sprinkled in the intervals. Operculum bronzed, iris greenish black, with a narrow golden ring on the inner border; D. and C. dark olive, margined with light grass green, the former with greenish white spots on the posterior half, some of them occasionally confluent; the latter with smaller spots of the same on the membrane, arranged in series transverse to the rays; A. and P. gamboge yellow on the distal half, with black spots posteriorly, the former with some light spots. Length three inches.

Female fishes corresponding to the *F. viridescens* of De Kay, and probably of this species, are uniform olive, with the belly yellowish white. Some specimens have obscure vertical dark lines.

This species is exceedingly abundant in the small creeks of the salt meadows, less numerous in the ponds. They are very active in their movements, darting to cover at the slightest alarm. Like all the other species, they are excessively voracious, and a dead fish of considerable size will be eaten up in a few minutes by the dense crowd of these diminutive scavengers, darting upon it from all points. A clam pounded up and thrown in among them, will in a moment attract many hundreds, and they are frequently taken for bait, by putting the clam into a scoop-net, and withdrawing the net suddenly, with the fish enclosed.

There is no doubt that the various species of cyprinodonts on our coast perform very important services in rapidly removing dead animals, as fishes, crabs, shells, &c., from the water, and thus keeping up the proper equilibrium. This they do to a much greater extent than the crabs, which, however, assist in the labor. Abundant everywhere along the shores and in the creeks and ponds of the meadows, they are always on hand to do their work.

Nothing was observed at Beesley point in regard to the reproductive peculiarities of any of the cyprinodonts, the season of the year not being favorable. It is very probable, however, that most of them are viviparous, like many other species of the family. Like the others, this one is remarkably tenacious of life, resisting successfully long absence from water, even to the extent of considerable desiccation.

A few specimens were caught in the fresh waters of Cedar Swamp creek. They are, however, essentially a salt water species.

---

38. Fundulus diaphanus, Agass.

Hydrargyra diaphana, Lesueur.—DeKay, New York Fauna, Fishes, 219.

This species was found abundantly in Ludlum's run, at a point where the water is perfectly fresh at low tide, but becomes brackish during high water. It was also taken in the fresh waters of Cedar Swamp creek. I do not remember to have ever noticed it in perfectly salt water.

39. Fundulus multifasciatus, Cuv.

Fundulus multifasciatus, Cuv. and Val., Hist. Nat. des Poiss. XVIII, 200.—*Hydrargyra multifasciata*, Lesueur.—De Kay, New York Fauna, Fishes, 220.

This species was found everywhere associated with *H. flavula*, but in quite limited numbers.

---

40. Hydrargyra flavula, Storer.

Hydrargyra flavula, Storer.—*Esox flavulus*, Mitch.—*Fundulus fasciatus*, DeKay, New York Fauna, Fishes, 216, plate xxxi, fig. 98.

This species may be called the giant of the northern cyprinodonts, attaining a size only approached by the females of *Fundulus zebra*. As in *F. zebra*, the female is considerably larger than the male. Specimens were taken nearly eight inches in length.

The *H. flavula* is very rarely found in the bays and meadows, the few that occur in such localities being very small, and much scattered. It is along the beach, and about the inlets, that the immense numbers that exist on our coasts can be appreciated. As the tide is rising and flowing over flat sands, or up the narrow shores and channel ways, this species will be seen in dense schools, slowly swimming with the tide, and readily recognised by its large size and the light spot near the dorsal fin.

It generally keeps distinct from the atherinas, which are equally or even more abundant in the same situations. A few *Cyprinodon ovinus* are sometimes seen in company, rarely any other species of the same family.

The sexes of this species are conspicuously different in marking, the male having many broad vertical bands on each side, from head to tail, the female two or three longitudinal ones.

---

41. Hydrargyra luciæ, Baird.

Hydrargyra luciæ, Baird.—General form elongated, though of rather short appearance. Head constituting less than one-fourth of total length. Insertion of anal slightly in advance of origin of dorsal, and rather more developed than the latter. Ventrals very small; their extremity reaching the anus. Tail large. D. 8; A. 9; C. 6, I. 8, 7, I. 5; V. 6; P. 15.

Dark olive green above, lower part of sides and beneath rich ochre yellow. Sides with 10 or 12 broad, well defined, vertically disposed dark bars, nearly as large as their inter-spaces, which are of a faint tint of greenish white. All the fins but the dorsal are of a uniform yellowish, lighter than the abdomen. Dorsal, yellow on the terminal

half, the basal portions olivaeeous, with a large blaek spot posteriorly, and immediately anterior to it a white one. The dark spot is bordered above and behind by the yellow part mentioned. In one specimen the posterior half of the base of the dorsal fin is dull white, with a large subeircular spot of blaek in the eentre. Length about one ineh.

P. similar, the dorsal unspotted, the yellow less intense.

A few specimens only were taken, in a small diteh at Robinson's landing, Peck's beaeh, opposite Beesley's point.

---

42. Cyprinodon ovinus, Val.

Cyprinodon ovinus, Valenc.—*Esox ovinus*, Mitch.—*Lebias ovinus*, DeKay, New York Fauna, Fishes, 215, plate xxvii, fig. 87.

This species was very abundant in the salt ponds, more so than any other; it was seen but rarely in the creeks or in the bays. Specimens were taken of much larger size than the supposed average; and the males. recognised by the black band on the end of the eaudal fin, were found to be larger than the females.

---

43. Cyprinodon parvus, B. & G.

Cyprinodon parvus, B. and G.—Form elongated, resembling a diminutive *Leuciscus;* head constituting less than a fourth of the total length; eye quite large and circular, being contained three times in the length of the side of the head; caudal posteriorly rounded.—D. 10; A. 10; C. 5. I. 7. 6. I. 4; V. 6; P. 15. Scales quite large, deeper than long, and disposed in eight longitudinal series upon the line of greatest depth of the body; seven series may be observed upon the peduncle of the tail.

This species was found in the small ponds of the salt meadows, generally in the grass; and owing to their diminutive size the males were not often taken, and, in fact, neither sex was found in anything like the abundanee of most other species. The colors during life were very plain, being without any of the peculiar patterns of other speeies. I observed it, sparingly, in many localities in Long Island, espeeially at Greenport. It has a close resemblance to the females of *Heterandria*.

---

44. Esox fasciatus, DeKay.

Short-billed Pike.

Esox fasciatus, DeKay, New York Fauna, Fishes, 224, plate xxxiv, fig. 110.

Brownish olivaeeous; a longitudinal lighter vertebral stripe. On eaeh side of the body a median longitudinal irregular band of golden,

sending off bars transversely above and below, sometimes opposite each other, sometimes alternate, occasionally branching and anastomosing. Beneath greenish or yellowish white. Iris purplish brown, with a golden interior ring.

Dorsal and caudal fins plain olive, tinged with red. A. V. P. pink—this color becoming rather deeper after death. Length, 10 inches. Abundant in Cedar Swamp creek. Specimens of considerably larger size were taken.

---

45. Esox reticulatus, Les.

Pickerel.

Esox reticulatus, Les.—DeKay, New York Fauna, Fishes, 223, plate xxxiv, fig. 107.

Rather rare in Cedar Swamp creek. Associated with *E. fasciatus*.

---

46. Belone truncata, Les.

The Bill-Fish—Sea-Pike—Silver Gar-Fish, &c.

Belone truncata, Lesueur.—DeKay, New York Fauna, Fishes, 227, plate xxxv, fig. 112.

Color.—Back dark green; sides opaque silvery white; beneath dull white—the lines of separation between these colors very distinct; cornea green; iris silvery; fins subtransparent, with fine punctations of greenish on the membrane, much thickest on the D. and C.; length, 8 inches.

The silver gar made its appearance, in August, in considerable numbers, though of quite small size. It was found in the shallow bays and creeks—more abundantly in the slues on the beach, keeping in compact bodies, and swimming slowly along.

This species is fond of running up into fresh water during the summer, and is often taken a considerable distance from the ocean. I have seen them in the village of Riverhead, Long Island; and they are at times quite abundant off the city of Washington. They have been seen at Columbia, Pennsylvania, in the Susquehanna. They sometimes are taken with a hook, although such an occurrence is quite rare. When of large size, their flesh is of excellent flavor.

---

47. Saurus mexicanus, Cuv.

Saurus mexicanus, Cuv. Règne Anim.—(Griff. transl.) X, 431.

A single specimen of this fish was taken in a seine in the river. Although abundant off the southern coast, it is rarely seen so far to the

north. Dr. DeKay does not enumerate it among the fishes of New York, yet several have been procured by Mr. Brevoort about Long Island.

---

48. Engraulis vittata, B and G.

The Anchovy.

Engraulis vittata, B and G.—*Engraulis mitchilli*, Cuv. and Val., Hist. Nat. Poiss. XXI.—*Clupea vittata*, Mitch.—DeKay, New York Fauna, Fishes, 254.

It is a little remarkable that no mention of the occurrence of *Engraulis* on the Atlantic coast of the United States, is made by any American writer. The species was long ago described by Dr. Mitchill, so accurately as clearly to indicate this genus; but Dr. DeKay does not appear to have noticed it at all.

The anchovy made its appearance early in August in the shallow waters along the beach, although of very small size. They became subsequently more abundant; and towards the end of the month, while hauling a large net in the surf, many were taken measuring over six inches in length. As the meshes of the net were very large, the greater portion readily escaped; but with a seine properly constructed enough could be readily procured to supply the American market.

I procured several specimens of this fish, in 1847, at the residence of Mr. Audubon, on the Hudson river, above New York.

---

49. Alosa menhaden, Mitch.

The Moss-Bonker—Bony Fish—Hard Head.

Alosa menhaden, Mitch.—Storer, Rep., p. 117.—De Kay, New York Fauna, Fishes, 259, plate xxi, fig. 60.

Back dark green, shading into yellowish, silvery on the sides and beneath. Iris silvery. A rounded dark spot behind the upper part of the operculum, and five or six smaller ones, less distinct, in a longitudinal row behind it, the latter sometimes indistinct. All the spots are on the skin, showing through the transparent scales.

D. and C. yellowish, with a dark margin; the remaining fins colorless.

The moss-bonker is a fish of great economical importance, as much so, perhaps, as any other on our coast. This is not on account of its flesh, which, though sweet, is too full of bones to be generally acceptable; as a manure, however, it replaces all other fertilizers on and near the sea-shore.

The countless schools of moss-bonkers, most of them of vast extent, seen everywhere on the Atlantic coast, represent a species quite equal in numbers to any other of the same size belonging to our fauna.

Every bay and river-mouth along our coast is filled with them during the summer, and they can everywhere be taken with great ease. The schools swim at the surface, their dorsal fins projecting above the water, and keeping it in such agitation as to be readily discernible at a great distance. They are generally followed by blue fish, sharks, and other predacious species, which commit such havoc in their ranks, it is said, that the gulls frequently follow in their wake to feed upon the fragments left floating behind.

The fishermen about Greenport, when in pursuit of moss-bonkers, lie some distance off shore, with two seines joined together, each seine resting on a separate boat, provided with its crew. When a school is seen of sufficient size to warrant the trouble, the joined ends of the nets are dropped into the water, and as the boats separate they make a turn, and thus enclose the fish; the ends of the nets are then taken to the shore, and the net itself drawn up by means of a windlass. Many thousands are taken at a haul, and meet with a ready sale. Quite recently several establishments have been erected on Long Island for the manufacture of oil from the moss-bonker. The fish, as brought in, are chopped up and boiled, and the oil skimmed off; a heavy pressure on the residuum expresses the remaining oil, and what is left is still useful as a manure. The oil finds a ready market. It has been estimated that a single fish will furnish enough oil to saturate a surface of paper eighteen inches square.

Most of these fish, however, are used directly as fertilizers, by being ploughed or hoed in the ground. It is quite customary when planting corn to place a fish in each hill, the result being seen in a very luxuriant growth of the plant.

Besides being taken in the manner just described and by single seines put out from the shore, many are captured in gill-nets set in channels of rivers and other localities frequented by them. Many are taken in this way in the Hudson river and tributaries, as well as elsewhere.

Besides its use as manure, the moss-bonker, from its abundance, is employed to a great extent as bait for other fishes. Chopped up fine, it constitutes a chief bait for eels in eel-pots, and the flesh is very attractive to the blue fish and other species. When used as food, it is usually skinned, to remove the oilier layer of black fat, and the back bone is generally taken out at the same time.

The moss-bonker is much infested by a species of lernaean, which is buried in the skin by its star-shaped processes with a long projecting thread.

The moss-bonker is not much sought after at Beesley's point, nor did I hear of any who made a business of catching them there for manure.

50. Alosa mattowaca, DeKay.

Alosa mattowaca, DeKay, New York Fauna, Fishes, 250, plate xl, fig. 127.—*Clupea mattowaca*, Mitch.

A few specimens were caught in the surf with a large seine.

---

51. Alosa teres, DeKay.

Alosa teres, DeKay, New York Fauna, Fishes, 262, plate xl, fig. 128.

A number of specimens of this rare species were found one day in the edge of the surf along the beach; they seemed to be very weak, and died soon after their capture.

---

52. Chatoessus signifer, DeKay.

Thread-Herring.

Chatoessus signifer, DeKay, New York Fauna, Fishes, 264, plate xli, fig. 132.

A few specimens were taken in a net in the bay. In life the back is bright green; the caudal fin yellow, black at the tip.

---

53. Platessa ocellaris, DeKay.

The long-toothed Flounder.

Platessa ocellaris, DeKay, New York Fauna, Fishes, 300, plate xlvii, fig. 152.

This flounder is caught very abundantly during the summer, especially in the month of July, when it frequently constitutes the chief result of a day's fishing. It is generally found on sandy bottoms, and bites readily at almost any bait. They are sometimes taken in large numbers by means of nets in the deep slues along the beach.

In winter they at times seem to be quite torpid on the shallow grounds, suffering themselves to be taken up with oyster tongs without making any attempt to escape.

---

54. Platessa plana, Storer.

The New York Flat-Fish—Winter Flounder.

Platessa plana, Storer.—DeKay, New York Fauna, Fishes, 295, plate xlviii, fig. 154, and plate xlvix, fig. 158.

A few specimens only of this species were taken in the shores on the beach. It is said to be found abundantly in the bay during winter.

55. Rhombus maculatus, Girard.

The spotted Turbot.

Rhombus maculatus, Girard, in 7th Ann. Rep. Reg. Univ. N. Y., on State Cab., 23.—*Pleuronectes maculatus*, Mitch.—DeKay, New York Fauna, Fishes, 302, plate xlvii, fig. 151.

Taken occasionally of small size in the surf.

---

56. Achirus mollis, Cuv.

The New York Sole.

Achirus mollis, Cuv., Règne Anim. II.—DeKay, New York Fauna, Fishes, 303, plate xlix, fig. 159.

A few specimens were caught in the river by means of seines. The species, though resident, is taken most frequently in early spring. When thrown on the shore it buries itself in the sand, and is out of sight in a few moments. It is familiarly known at Beesley's Point under the name of hog-choker, as when seized by the hogs it doubles itself up, and, filling the æsophagus, obstinately resists by the scabrous nature of its scales all effort on the part of the animal to swallow it.

---

57. Anguilla tenuirostris, DeKay.

Anguilla tenuirostris, DeKay, New York Fauna, Fishes, 300, plate liii, fig. 173.

As might be expected from the vast mud-flats of the bay and its generally muddy bottom, eels are exceedingly abundant about Beesley's point. In passing slowly over the shallow waters near the shore, they will be seen darting out from among the sea-weeds at the bottom every few rods, and may readily be captured by a skillful hand armed with a gig. They can be caught readily, likewise, by means of a hook and line, by bobbing, with eel-pots, and the other devices suitable to the capture of the genus. Night is, of course, the best time for taking them in any way.

In winter they bed in the soft mud, to the depth of about a foot, and are then easily secured by means of a broad gig or spear.

58. Conger occidentalis, DeKay.

The Conger Eel.

Conger occidentalis, DeKay, New York Fauna, Fishes, 314, plate liii, fig. 172.

Clear olive above, shading into silvery on the sides and beneath. Vertical fins thin and transparent, with a narrow and well defined margin of brownish black. Iris, silvery. After death the silvery hue is more predominant.

Only one specimen of this species was taken at Beesley's point. It was captured on the 16th of August at Molasses point, and seemed entirely unknown to the residents.

---

59. Ophidium marginatum, DeKay.

Ophidium marginatum, DeKay, New York, Fauna, Fishes, 315, plate lii, fig. 169.

One specimen was taken during the past winter, and presented by Mr. Chatten.

---

60. Syngnathus viridescens, DeKay.

The Green Pipe-Fish.

Syngnathus viridescens, DeKay, New York Fauna, Fishes, 321, plate liv, fig. 176.

This pipe-fish was very abundant in the sea-weed and grass near the mouths of the inlets, every haul of the net bringing in hundreds. They were of many shades and colors, and of sizes varying from one inch to eight.

---

61. Diodon maculato-striatus, Mitch.

The Spot-Striped Balloon-Fish.

Diodon maculato-striatus, Mitch.—DeKay, New York Fauna, Fishes, 323, plate lvi, fig. 185.

A few specimens were taken in the river.

---

62. Diodon fuliginosus, DeKay.

Diodon fuliginosus, DeKay, New York Fauna, Fishes, 324, plate lv fig. 181.

A few specimens captured in the river by means of a seine.

63. Tetraodon turgidus, Mitch.

Toad-Fish.

Tetraodon turgidus, Mitch.—DeKay, New York Fauna, Fishes, 327, plate lv, fig. 178.

Dark olive green above and on the upper part of the sides, with fine black points intermixed. Abdomen and beneath, pure opaque white. Lower part of sides ochre yellow, with six or seven large vertically oblong and rounded blotches of brown. Above these are occasionally traces of dark mottling; fins pale yellowish. Iris reddish brown, with an inner circle of a coppery or brassy color.

This fish is frequently caught in the bay of Great Egg harbor, while fishing for better species. When drawn up, it immediately inflates its body to a prodigious size by means of short jerking inspirations, the sac becoming distended with air if in the atmosphere, or water, when submerged. By scratching it on the belly or pounding it, it will readily inflate itself several times in succession, and again discharge its load at a single effort through mouth and gills. When inflated and thrown on the water, it will sometimes float to a great distance before collapsing.

The skin around the eye of this species is contractile to such an extent as completely to close up the latter by a kind of puckering.

This fish is most abundant in summer; rarely, if ever, taken during the winter, and only occasionally in early spring.

---

64. Carcharias cæruleus, DeKay.

The small blue Shark.

Carcharias cæruleus, DeKay, New York Fauna, Fishes, 349, plate lxi, fig. 200.

The blue shark was quite abundant in the bay during the summer, and quite a number were captured by various parties. They were taken by means of large shark-hooks baited with eels or other fish, a small keg being used as a float. Several of the boats always carried shark-lines, which were put out when on suitable ground, the buoy being allowed to float off to some distance. On getting a bite the small lines would be taken up, the anchor raised, and every effort made to tire out the shark. Sometimes the fish would be towed to an island and hauled up, or again drawn in to the side of the boat, and killed by means of a harpoon or sword. The largest taken in this way was about nine feet long.

Though sufficiently abundant to be seen any day swimming with their dorsal fins above the surface, no instance was mentioned by the inhabitants of their attacking bathers while in the water.

Small specimens were occasionally taken on hooks baited for other fish.

65. Mustelus canis, DeKay.

The Hound-Fish—Dog-shark.

Mustelus canis, DeKay, New York Fauna, Fishes, 355, plate lxiv, fig. 200.

The little dog-shark was sufficiently abundant to constitute a grievous pest to those who aimed after something more edible. It was no uncommon thing to see from ten to twenty taken in a few hours' fishing. They bite at almost any bait, and their presence is generally fatal to much success among other species. The flesh is not very palatable, having much of the coarse and rank flavor of the sea cat-fish.

---

66. Zygæna tiburo, Val.

Zygæna tiburo, Val.—Yarrell, Brit. Fish., I, 507—*Squalus tiburo*, Linn. Syst. Nat. I, 399, 6.

Only one specimen of this shark was obtained, although several were taken by the fishermen. This one was caught by Mr. Charles Ashmead, in the bay, and measured about eighteen inches. The *Z. malleus* is also said to occur even more abundantly than the present species. I do not find this species recorded hitherto as occurring on the North American coast.

---

67. Pastinaca hastata, DeKay.

The Whip Sting-ray.

Pastinaca hastata, DeKay, New York Fauna, Fishes, 373, plate lxv, fig. 214.

This species was found to be abundant in the bay and elsewhere. It was frequently taken with the hook, and every haul of the seine in the surf brought in numbers. The smallest caught were about the size of a breakfast plate, the largest measured about four feet across, with a tail five feet long.

The wounds inflicted by means of the serrated spine on the tail of the sting-ray are justly dreaded by the fishermen, who use the greatest care in handling them. The usual practice is to cut off the tail at once, and thus place the fish *hors de combat*. Instances have been known of this spine being driven through the hand with such violence as to render it necessary to pull it out from the opposite side.

The large ones, when brought in by the seines, are so heavy as materially to impede the hauling of the net. In this case some of the men were in the habit of thrusting the handle of an oar into the orbit, and with this convenient *point d'appui* sliding the monster out upon the bank.

INDEX.

Abramis versicolor..... 27
Acanthocottus..... 14
Achirus mollis..... 36
Ailurichthys marinus.... 27
Alosa mattowacca..... 35
Alosa menhaden..... 33
Alosa teres..... 35
Anchovy (*Engraulis*).... 33
Anguilla tenuirostris..... 36
Aphredoderus sayanus... 12
Argyreiosus capillaris.... 23
Atherina notata..... 24
Atherinopsis notatus..... 24

Balloon Fish (*Diodon*)... 37
Barracuda (*Sphyræna*)... 12
Bass, Black (*Centropristes*) 9
Bass, Sea (*Centropristes*). 9
Bass, Striped (*Labrax*)... 7
Batrachus variegatus.... 26
Beesley's Point(described) 4
Belone truncata..... 32
Bill Fish (*Belone*)..... 32
Black Bass (*Centropristes*) 9
Black Fish (*Centropristes*) 9
Black Fish (*Tautoga*).... 26
Blue Fish (*Otolithus*).... 15
Blue Fish (*Temnodon*)... 23
Boleosoma..... 14

Caranx chrysos..... 22
Carcharias cærnleus..... 38
Catastomus gibbosus.... 27
Catfish, Sea (*Ailurichthys*) 27
Cedar Swamp creek, Atlantic county..... 6
Cedar Swamp creek, Cape May county..... 6
Centrarchus pomotis..... 11
Centropristes nigricans.. 9
Chatoessus signifer..... 35
Chub (*Tautoga*)..... 26
Clupea vittata..... 33
Conger Eel (*Conger*).... 37
Conger occidentalis..... 37
Corson's inlet (described) 5
Corvina argyroleuca..... 17
Crab (*Lupa*)..... 16
Cybium maculatum..... 21
Cyprinodon ovinus..... 31
Cyprinodon parvus..... 31

Darter (*Boleosoma*)..... 14
Diodon fuliginosus..... 37
Diodon maculato-striatus. 37
Dory (*Lichia*)..... 22
Drum (*Pogonias*)..... 18

Eel (*Anguilla*)..... 36
Engraulis mitchilli..... 33
Engraulis vittata..... 33
Esox fasciatus..... 31
Esox reticulatus..... 32
Eucinostomus argenteus . 21

Flounder (*Platessa*)..... 35
Flying-Fish (*Prionotus*).. 13
Fundulus diaphanus..... 29
Fundulus multifasciatus.. 30
Fundulus viridescens.... 29
Fundulus zebra..... 28

Galeichthys marinus.... 27
Gar, Silver (*Belone*)..... 32
Gasterosteus quadracus.. 14
Gobius alepidotus..... 25
Goby (*Gobius*)..... 25
Goody (*Leiostomus*)..... 15

Hake (*Phycis*)..... 17
Hake (*Umbrina*)..... 17
Hammer-head Shark (*Zygæna*)..... 39
Hard-Head (*Alosa*)..... 33
Harvest Fish (*Peprilus*).. 24
Herring, Thread (*Chatoessus*)..... 35
Hog-choker (*Achirus*) ... 36
Horse Mackerel (*Temnodon*)..... 23
Hydrargyra diaphana.... 29
Hydrargyra flavula..... 30
Hydrargyra luciæ..... 30

King Fish (*Umbrina*).... 17

Labrax lineatus..... 7
Labrax mucronatus 8
Labrax rufus 8
Lafayette (*Leiostomus*)... 15
Lebias ovinus..... 31
Leiostomus obliquus..... 15
Leuciscus pygmaeus..... 28
Leucosomus americanus . 27
Lichia carolina..... 21
Lichia spinosa 22
Lobotes emarginatus 18
Ludley's run (described). 6
Lupa dicantha..... 16

Mackerel, Horse (*Temnodon*)..... 33
Mackerel, Spanish, (*Cybium*)..... 21
Mackerel, Yellow, (*Caranx*)..... 22
Melanura pygmaea..... 28
Molasses point..... 16
Mossbonker (*Alosa*)..... 33
Mud Fish (*Melanura*) ... 28
Mugil albula 25
Mullet (*Mugil*) 25
Mustelus canis..... 39

Ophidium marginatum .. 37
Otolithus regalis..... 15
Oyster Fish (*Batrachus*).. 26

Pagrus argyrops..... 19
Pastinaca hastata 39
Peck's beach 51
Pell, R. L., breeding Rock in fresh water..... 77
Peprilus triacanthus..... 24
Perca flavescens 9
Perch, Silver (*Corvina*).. 17
Pickerel (*Esox*)..... 32
Pike, Short-billed (*Esox*). 31
Pipe Fish (*Syngnathus*).. 37
Platessa ocellaris..... 35
Platessa plana..... 35
Pleuronectes maculatus.. 36
Pogonias facsiatus..... 78
Pomotis chætodon..... 10
Pomotis obesus..... 10
Porgee (*Pagrus*)..... 19
Prionotus pilatus..... 13
Puffer (*Tetraodon*)..... 38

Ray, Sting (*Pastinaca*) .. 39
Rhombus maculatus..... 36
Rhombus triacanthus.... 24
Rock Fish (*Labrax*)..... 7

Sand Smelt (*Atherina*)... 24
Saurus mexicanus..... 32
Sculpin (*Acanthocottus*).. 14
Sea Bass (*Centropristes*).. 9
Sea Cat (*Ailurichthys*)... 27
Sea Pike (*Belone*)..... 32
Shark, Blue (*Carcharias*). 38
Shark, Dog (*Mustelus*)... 39
Shark, Hammerhead (*Zygæna*)..... 39
Shiner (*Leucosomus*)..... 27
Short-billed Pike (*Esox*). 31
Silver Gar (*Belone*) 32
Silver Perch (*Corvina*)... 17
Skip Jack (*Temnodon*)... 23
Smelt, Sand (*Atherina*).. 24
Sole (*Achirus*)..... 36
Spanish Mackerel (*Cybium*)..... 21
Sphyræna borealis..... 12
Squeteague (*Otolithus*) .. 15
Stickleback (*Gasterosteus*) 14
Sting Ray (*Pastinaca*)... 39
Striped Bass (*Labrax*)... 7
Sucker (*Catastomus*)..... 27
Sunfish (*Pomotis*) 10
Syngnathus viridescens .. 37

Tailor (*Temnodon*) 24
Tautog (*Tautoga*)..... 26
Tautoga americana..... 26
Temnodon saltator..... 23
Terms, explanation of... 6
Tetraodon turgidus..... 38
Thread Herring (*Chatoessus*)..... 35
Toad Fish (*Batrachus*)... 26
Toad Fish (*Tetraodon*)... 38
Trachinotus spinosus.... 22
Turbot (*Rhombus*)..... 36

Umbrina alburnus..... 17

Weak Fish (*Otolithus*)... 15
Whip Ray (*Pastinaca*)... 39
White Fish (*Temnodon*).. 23
Whiting (*Umbrina*) 17
Wind Fish (*Leucosomus*). 27
Winter Flounder (*Platessa*) 35

Yellow Mackerel(*Caranx*) 22

Zygæna malleus..... 39
Zygæna tiburo..... 39